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AMENDMENT TO THE CLAIMS

What is claimed:

1. (Currently Amended) A method of measuring an optical distance comprising the steps of:

providing a first wavelength of low coherence light and a second wavelength of light;

directing light of the first wavelength and the second wavelength along both a first optical path and a second optical path, the first optical path extending onto a medium to be measured and the second path undergoing a change in path length;

detecting light from the medium and light from the second optical path to measure a first change in phase of light interacting with the medium;

adjusting the first wavelength of light to generate a third wavelength of low coherence light;

directing light of the third wavelength and the second wavelength along both the first optical path and the second optical path, the first optical path extending onto the medium to be measured and the second path undergoing a change in path length;

detecting light from the medium and light from the second optical path to ~~re-measure~~ measure a second change in phase of light interacting with the medium;

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superposing the first change in phase and the second change in phase to determine at least two phase crossing points; and

determining the optical distance by counting the number of continuous interference fringes between the at least two phase crossing points.

2. (Original) The method of Claim 1 wherein the medium comprises biological tissue.

3. (Original) The method of Claim 1 wherein the medium comprises a semiconductor material.

4. (Original) The method of Claim 1 further comprising the step of refining the optical by measuring the difference phase at the at least two phase crossing points.

5. (Original) The method of Claim 1 wherein the step of changing the first wavelength of light comprises adjusting a center wavelength by approximately 2 nm.

6. (Original) The method of Claim 1 further comprising providing a light source that emits the first wavelength and a second wavelength that are harmonically related.

7. (Original) The method of Claim 1 further comprising providing a first low coherence light source and a second continuous wave light source.

8. (Currently Amended) A method for measuring an optical distance, comprising the steps of;

providing a first signal and a second signal generated by a first low coherence light source and a third signal generated by a second light source, the first light source being harmonically related to the second light source;

determining a first heterodyne signal from the first and the third signal and a second heterodyne signal from the second and third signal; and

determining the phase relationship between the first and second heterodyne signals to obtain the optical distance.

9. (Currently Amended) The method of Claim 8 wherein the first signal and second signal are low coherence signals having a difference in wavelength of at least 1 nm.

10. (Original) The method of Claim 8 wherein the third signal is a continuous wave signal.

11. (Original) The method of Claim 8 wherein providing the first and the second signals are generated by a broadband light source.

12. (Currently Amended) A system for measuring an optical distance, comprising the steps of:

a first low coherence light source that generates a first signal and a second signal;

a second light source that generates a third signal, the first low coherence light source ~~being~~ generating signals that are harmonically related to the third signal from the second light source;

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a detector system that measures a first heterodyne signal from the first and the third signal and a second heterodyne signal from the second and third signal; and

a processor that determines a phase relationship between the first and second heterodyne signals to obtain the optical distance.

13. (Original) The system of Claim 12 wherein the first signal and second signal are low coherence signals.

14. (Original) The system of Claim 12 wherein the third signal is a continuous wave signal.

15. (Original) The system of Claim 12 wherein the first and the second signals are generated by a broadband light source.

16. (Original) The system of Claim 12 further comprising an optical pathway including an optical fiber.

17. (Original) The system of Claim 12 further comprising a low coherence signal having a bandwidth of at least 5 nm.

18. (Original) The system of Claim 12 wherein the system comprises an interferometer.

19. (Original) The system of Claim 12 further comprising a mirror and a scanner that scans the mirror from a first position to a second position.

20. (Original) The system of Claim 12 wherein the detector system comprises a first detector that detects a first signal

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and a second detector that detects a second signal harmonically related to the first signal.

21. (New) The system of Claim 12 further comprising an analog to digital converter in communication with the processor.

22. (New) The system of Claim 12 wherein the first light source is a laser source.

23. (New) The system of Claim 16 wherein the continuous wave signal is generated by a semiconductor laser.

24. (New) The system of Claim 12 wherein the system measures optical distance.

25. (New) The system of claim 12 wherein the system measures refractive index of the medium.

26. (New) The system of claim 12 wherein the medium comprises biological tissue.

27. (New) The system of claim 12 wherein the detector further comprises a filter.

28. (New) The system of claim 12 wherein the system counts a number of interference fringes between phase crossing points.

29. (New) The system of claim 12 wherein the system measures a thickness of the medium

30. (New) A method of measuring a characteristic of biological tissue, comprising the steps of:

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providing a first signal and a second signal generated by a first low coherence light source and a third signal generated by a second light source, the first light source generating a signal that is harmonically related to a signal from the second light source;

determining a first heterodyne signal from the first and the third signal and a second heterodyne signal from the second and third signal; and

determining a phase relationship between the first and second heterodyne signals to obtain the characteristic of biological tissue.

31. (New) The method of Claim 30 further comprising determining a dispersion profile of the biological tissue.

32. (New) The method of claim 30 wherein the first signal and second signal are low coherence signals having a difference in wavelength of at least 1 nm.

33. (New) The method of Claim 30 wherein the third signal is a continuous wave signal.

34. (New) The method of Claim 30 wherein the step of providing the first and the second signals includes using a broadband light source.

35. (New) The method of Claim 30 wherein the biological tissue comprises at least one of the cornea, the aqueous humor and vitreous humor.

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36. (New) The method of Claim 30 further comprising detecting a blood glucose level using a dispersion profile.

37. (New) The method of Claim 30 further comprising determining refractive index variations at a plurality of wavelengths using a dispersion profile.

38. (New) The method of Claim 30 further comprising determining a refractive index of the biological tissue.

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